New England Deaconess Hospital

pulse

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Infusion pump eases chemotherapy side-effects

Thanks to a treatment method designed and pioneered at the Deaconess, the acute side-effects of nausea and vomiting were virtually eliminated among 50 Deaconess cancer chemotherapy patients who received their medication through a special, central venous catheter combined with an ambulatory infusion pump.

The system infuses an accurate, continuous flow of medication into a patient's bloodstream through a catheter inserted into the central vein under the collar bone. The Deaconess is currently the only hospital in the country to administer cancer chemotherapy in this manner, according to Dr. Jacob J. Lokich, chief of the Deaconess medical oncology section.

"When chemotherapy is given in the usual fashion – through weekly injections – we have to use the optimal dose which will damage the tumor cells and, as far as possible, spare the normal cells," said Dr. Lokich. "Unfortunately, this optimal, high dose triggers the vomiting center in the brain," he continued. "We can avoid this problem by using the infusion pump since the low, steady dosage gives the body time to adjust slowly to the drug."

Having determined that the system has essentially erradicated the acute effects upon the gastrointestinal tract caused by cancer chemotherapy, Dr. Lokich and his colleagues now are conducting a comparative study to see if the infusion pump method is at least as effective in arresting tumor development as other means of delivering chemotherapy.

"Since chemotherapy drugs disappear from the bloodstream anywhere from minutes to hours after being injected, the tumor (cancer) cells are not being exposed to drugs for very long," said Dr. Lokich. "In fact, only a fraction of the tumor cells actually may be affected because cells are not active all

(continued on page 4)

The ambulatory infusion pump is worn by the patient in a shoulder or belt holster. The pump (see inset photo) is self-contained, battery-operated and weighs approximately 17 ounces. A drug reservoir bag and tubing set, which holds a little less than two fluid ounces, is placed inside the pump case. The tubing is threaded through the pump mechanism and is attached to a special central venous catheter.

Employees receive special merit increase

At its meeting on February 24, the NEDH Board of Trustees approved a special merit increase and the addition of a dental plan to the employee benefits program.

As a result of the special merit increase and improved benefits program, the Deaconess now has the best overall compensation and employee benefits program of any Boston teaching hospital.

Beginning March 1, all eligible Deaconess employees received an 8% increase in salary, and an increase in on-call pay to $1.75 per hour (for medical, technical and nursing staff members). This wage increase is in addition to the annual merit program in which all employees may receive wage increases based on performance.

The approved dental plan for eligible employees and their dependents will encourage and provide substantial support for preventive and restorative dental care services. Dental coverage will begin by June 1, 1981. Details of the dental program will appear in a future issue of PULSE.

In announcing the special merit increase and improved benefits to hospital employees, Director Richard E. Lee said, "We appreciate your hard work and all that you do to make the Deaconess Hospital a very special place."

Cardiovascular fitness program attracts hospital-wide participation

Hundreds of Deaconess employees learned how to control the risk factors associated with cardiac disease through a lecture/film series held February 9-27.

The three-week program was organized by Mary Lou Rawson, cardiac dietitian, with assistance from Ruth Clark, staff project dietitian, and staff members in the physical and respiratory therapy, cardiology and nursing departments.

According to Ms. Rawson, one of the highlights of the program was the employee response to blood pressure checks and lung capacity tests which were conducted in the cafeteria on February 11 and 12.

"Since symptoms of hypertension are not necessarily obvious, many people get lax with their medication, forgetting that you have to control high blood pressure," said Ms. Rawson. "Several employees went back on their medication after being tested by nurses Maureen Morrissey and Ellen Leary, while others were advised to see their physicians," she concluded. Head nurse Morrissey did follow-up checks on two employees who regained control of their high blood pressure after returning to their medication. "What impressed me about the turn-out for tests, was the wide representation from all areas of the hospital, not just employees who are directly associated with health care," said Ms. Morrissey.

Respiratory technician Janice McGonagle and respiratory therapists Marshall Feldman and Jim Merlin performed about 250 lung capacity tests to measure the level of carbon monoxide found in employees who smoke. "We compared the vital capacity of a smoker's lungs to that of a non-smoker of the same age and body size," said Ms. McGonagle. "I think that having the opportunity to see the results in front of them gave people the momentum to change their smoking habits," she continued.

Charlotte Brantley, dietary assembler, has her blood pressure taken during a follow-up visit with head nurse Maureen Morrissey, Baker 5.

Other activities included: a lecture on "Diet, Facts, Fads, Fantasies" by Ms. Clark and Ms. Rawson; a demonstration of diagnostic tools used in heart disease; by cardiology fellow Tom Nessa, M.D.; a discussion of stress and stress management by Dr. Roland Ungerer, NEDH psychiatrist; and a session on aerobic and cardiovascular fitness by physical therapist Kathy Trembowicz.

Employees honored at service awards coffee hour on February 13

Fifteen-year recipients *(l-r): Francis N. Puopolo, surgical services; Peter Campisano, administration; Everett N. Nickerson, engineering and maintenance; and Pearline T. McCloud, building services.*

Five-year recipients *(back row, l-r): Marion H. Sciarappa, medical records; Eloise Bolster, nursing service; William A. Mochi, accounting; (front row, l-r) Connie Nielsen, personnel; Isabel Torres, building services; Hazel M. Belle and Joyce I. Callaham, dietary.*

Thirty-year recipient Rita M. Brennan, dietary.

Twenty-year recipient Michael Bracken, who maintains the hospital's grounds.

Five-year recipients *(back row, l-r): Donna L. Blackwell and Shawn R. Kinney, laboratories; Flaubert Morency, surgical services; Suzanne P. Piening, social services; (front row, l-r) Junie Mombrun and Debra St. George, laboratories; Anne M. DeRosa, Deaconess Medicine.*

Deaconess News in Brief

Kathryn Osmond, former associate director of financial aid at Wellesley College, has been named director of financial aid for the School of Nursing at NEDH. She also will also assist Nancy Howard, general counselor, with student recruitment.

Mary Ann Simpson has received a grant from the National Kidney Foundation of Massachusetts which will fund a one-year position with Dr. Anthony P. Monaco's transplant program at NEDH. Currently studying for a Ph.D. in immunology at Northeastern University, Ms. Simpson graduated from the Deaconess School of Medical Technology in 1973.

Nancy L. Sweeney, RN, unit teacher for the recovery room, conducted an all-day seminar, March 1, on the role of intra-aortic balloon pumping in hemodynamics and patient management. Approved by the Massachusetts Nurses Association, the course offered continuing education units to the 40 participants, including nurses from the recovery and operating rooms and anesthesia service.

Pam Bouchard, RN, participated in an American Heart Association program entitled "Cardiac Crisis and the Family – the Adolescent Response" on March 11, at St. Elizabeth's Hospital. The program, which is part of an ongoing cardiovascular nursing series, was attended by nurses and nursing students from various levels and areas of practice.

Oncology Dietitian Specialist **Peggy Oberfell** co-authored a review of the Third Annual Symposium on Nutritional Management of the Cancer Patient, which appeared in a recent issue of "RD" magazine.

Special note:
On April 3
the Joslin Diabetes
Foundation is
changing its name
to the
Joslin Diabetes Center.
See the April issue of
PULSE for details.

Ten-year recipients *(l-r): Elizabeth Woodworth, administration II; Joseph R. Saulnier, security; Jennie V. Grier, building services; Dennis G. Monty, engineering and maintenance; and Virginia S. Collela, building services.*

Twenty-year recipient Brian W. Bernier (l), Cancer Research Institute.

Cell Saver: donating blood to yourself

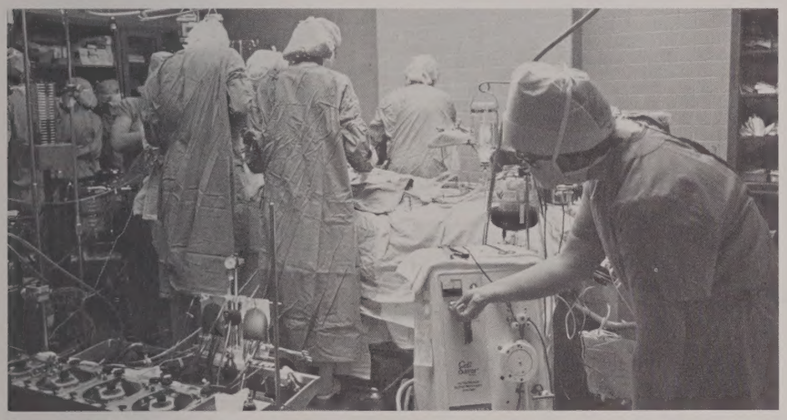
Recently, a 77-year-old male patient was rushed into the operating room where a Deaconess surgical team headed by Drs. Frank C. Wheelock and Gary W. Gibbons feverishly worked to arrest massive internal bleeding. Moments before, the patient had suffered a ruptured aneurysm of the abdominal aorta, a major artery leading away from the heart.

Almost immediately after opening the patient's abdomen, the surgical team began sterile suctioning of escaping blood via plastic tubing into a nearby blood recycling machine called the Cell Saver. The machine is part of the intraoperative autologous transfusion service provided by the blood bank.

During the next five hours, as surgeons skillfully replaced the section ruptured by aneurysm with a graft of knitted Dacron, the Cell Saver continuously received suctioned blood into its four-pint capacity plastic reservoir. The arriving blood was a mixture of red cells, plasma, surgical medications, white blood cells, anticoagulant fluid and other components.

Periodically, as the reservoir filled, an attending blood bank technologist activated the Cell Saver and the blood was pumped through lines into a centrifuge bowl. The centrifuge spun out and collected the red blood cells and discarded the remaining fluid. Collected red cells then were washed in saline solution and transfused back into the patient as needed. During this particular operation, the Cell Saver returned 23 units of red blood cells to the patient. The operation was successful, and the patient now is well along the road to recovery.

According to vascular surgeons and blood bank personnel at the Deaconess, the Cell Saver has proved during the past 1½ years to be an indispensable aid in procedures where blood loss is great. In 1980, for example, the Cell Saver was used at the Deaconess on 487 open-heart and major vascular surgical patients. During this period, the Cell Saver purified and returned about 2,050 units of red blood cells to these patients – blood that otherwise would have to be drawn from expensive blood bank supplies.



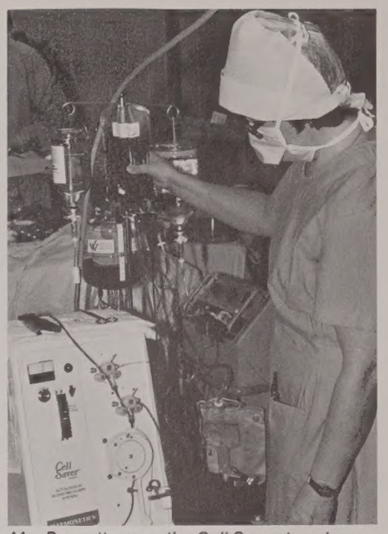
As a surgical team performs open-heart surgery in the background, blood bank technologist Jeannine Bensette recovers much of the patient's blood with the Cell Saver. Red blood cells will be cleansed and returned to the patient during surgery.

During open-heart procedures, the patient is connected to the Cell Saver and to a heart and lung pump which performs these bodily functions during surgery. Even here, the Cell Saver is cost effective although, on the average, the amount of blood salvaged in open-heart operations (about four units of red cells) is far less than cases of ruptured aneurysms. Each unit of red cells saved would otherwise cost the patient $100 per unit to replace from outside sources. The expense of the Cell Saver and blood bank technologist to run the machine during surgery is only about $250. Thus, fewer than three units of red cells need to be recovered to pay for use of the equipment.

Use of the Cell Saver machine is inappropriate for several types of patients. Cancer patients are excluded to avoid the possibility of spreading malignant cells to other parts of the body via the bloodstream. Other patients with infectious diseases are not candidates due to the risk of spreading the disease-producing organisms.

Dr. Gibbons, a member of the surgical team which performed the successful repair of the ruptured aneurysm, says that in certain instances the Cell Saver is a life saver.

"In this particular case involving massive hemorrhaging," Dr. Gibbons stated, "having blood readily available to give back to the patient, as needed, certainly helped the outcome of the operation. With patients having rare blood types, it can mean the difference between life and death."



Ms. Bensette uses the Cell Saver to salvage a unit of red blood cells from a patient undergoing open-heart surgery.

Dr. Agnes Kim, director of the blood bank, credits the Cell Saver with many advantages for patients in addition to its cost benefit. "Using the patient's own blood eliminates the possibility of mismatching his blood type," she said, "and also minimizes his chances of contracting blood-borne diseases like hepatitis."

According to Dr. Kim, the religious beliefs of most Jehovah's Witnesses prohibits them from being transfused with another person's blood. However, some of them will accept autotransfusion of their own blood by the Cell Saver during surgery.

The recent addition of a third Cell Saver at the Deaconess now permits coverage for all major vascular operations. Without these machines to aid surgical teams, the blood bank would need to replace additional units of blood and the hospital's bill for obtaining blood from outside sources – which last year exceeded $500,000 – would soar even higher.

Computerized typing comes to NEDH

Deaconess secretaries soon may be spared the drudgery of repetitive forms of typing, thanks to newly installed computerized word processing equipment.

For the past several months, secretaries in three NEDH departments (diagnostic radiology, clinical pathology and the grants and contracts office of the Cancer Research Institute) have been testing the new equipment. Each of the three locations is equipped with a cathode-ray tube (CRT), with typing keyboard and adjoining high-speed printer. Both units are connected to a central control minicomputer in the Farr building.

With word processing equipment, the CRT keyboard effectively replaces the conventional typewriter. Now, a secretary merely types copy on the keyboard and the information appears instantly and electronically on the tube. In less than 30 seconds, the printer can produce a page of typewriter quality copy on letterhead or continuous computer paper. Secretaries can request up to 250 copies of single-page documents.

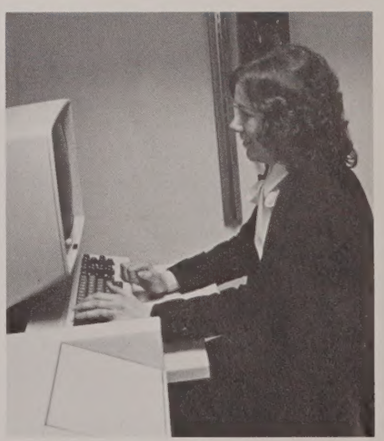
One great advantage of the new system is that it permits secretaries to correct individual typing errors quickly without spoiling entire pages of type. In addition, the word processor also provides ease in deleting whole lines, blocks and paragraphs of copy and in making appropriate substitutions.

Thus far, the new equipment is receiving rave reviews from personnel in the three test departments.

Ruth Marshall, a secretary at the Cancer Research Institute, finds the new equipment is particularly helpful in updating and editing lengthy scientific papers. "It's phenomenal how easy it is for me to make insertions into manuscripts with this equipment. And since the computer has a storage capacity, I can call previous manuscripts onto the tube and update them right on the machine. It's a great time saver, and it only took me about two weeks to really get used to the system."

With the test phase of word processors nearly completed, current plans call for evaluating the equipment needs of other hospital departments. Some of the larger units will receive their own CRTs and printers. Other departments will share access to centrally located word processors.

NEDH Associate Director Peter Campisano, who is coordinating the hospital's entry into word processing, is enthusiastic about the system. "Installation of the equipment should result in significant cost avoidance and greatly aid secretaries in meeting publishing deadlines for journal articles and medical research proposals," said Mr. Campisano. "In addition, it puts NEDH into the mainstream of progressive information processing by integrating this system with the hospital's central data processing facility," he noted.



Christine Gordon, word processing control operator, types a document on the computerized CRT unit.

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Infusion pump *(continued from page 1)*

of the time – only when they are in what we call the *growth cycle*. The theory at work here is that if we keep the drug in the bloodstream for a protracted period of time, we will affect more tumor cells as they divide and reproduce," Dr. Lokich explained.

The portable infusion pump is a self-contained, battery-operated unit which weighs only about 17 ounces. The pump, manufactured by Cormed Pump Inc. of New York, can infuse from 5-50 cubic centimeters of fluid over a 24-hour period. The patient wears the pump in a shoulder or belt holster while the medication flows through the tubing to a special, central venous catheter inserted into the large vein located under the clavicle (collar bone). Other delivery options include the infusion of medication through arteries located in other parts of the body – for example, the hepatic artery for treatment of tumors in the liver.

"Delivering the medication continuously through the central subclavian vein provides for a steady, well-distributed dosage," said Dr. Albert Bothe, an NEDH surgeon and associate director of the Deaconess Nutrition Support Service. Dr. Bothe adapted central venous catheter techniques for cancer chemotherapy from those used in parenteral nutrition by constructing a short subcutaneous (under the surface of the skin) "tunnel" over the chest wall and into the subclavian vein (under the clavicle or collar bone).

"The infusion pumps originally were developed for hyperalimentation patients who can not ingest adequate amounts of food, thereby permanently requiring intravenous nutrition," said Dr. Bothe. "The companies manufacturing the pumps modified them so they could deliver small doses of chemotherapy drugs. In this way, the home parenteral nutrition technology was transferred to cancer chemotherapy," he noted.

Depending on the physician's assessment of tumor response, the patient may continue on the pump throughout treatment. When the Deaconess program began early in 1979, patients were on the pump for five days at a time before taking a "break" to give normal cells a chance to recover. Patients now stay on the pump for a minimum of 30 days, and one patient has been on the pump continuously for four months, according to Dr. Lokich.

With the use of a pump, patients are allowed greater mobility. They visit the NEDH chemotherapy unit once a week to see their physician and oncology nurse for an evaluation of treatment response and pump performance. Otherwise, the patient maintains the pump at home with the help of a family member who changes the medicine bag and the dressing which covers the venous catheter exit site.

"Maintaining the sterile field isn't easy. There isn't room for error," said NEDH Oncology Nurse Clinician Nellee Fine who, along with Oncology Nurse Specialist Joanne Perri, instructs patients and their families in a rigorous educational program, including practice with model pumps, explanation of drug side-effects and supervision of the patients' dressing changes until they feel secure with performing the procedure themselves.

"Patients know that, if they have a problem with the pump, they should replace the medication bag with one filled with saline and call their physician or oncology nurse immediately," said Ms. Fine. "Because of the progressive nature of a drug reaction," she explained, "patients know they have to get advice quickly, but also that they don't have to panic."

"You can't predict from the outset who's going to be able to handle the pump and who isn't," Ms. Fine continued. "Some patients are too overwhelmed by the fact of their disease to cope with it, while others are able to adjust better because they are actively participating in their treatment."

Mrs. Irene Kenworthy, whose husband is a Deaconess chemotherapy patient using the ambulatory infusion pump, said she was "nervous, at first, about changing the dressing and remembering all the steps involved; but it's quite easy now," William Kenworthy finds that the pump gives him freedom of movement, but he shares with other patients using the pump the problem of logistical planning for taking a bath, since the dressing must remain dry. "I have been on the pump for six weeks, and I haven't had any ill side-effects," said Mr. Kenworthy. "I'm feeling better in general, and I'm sleeping a lot easier than I was when I received chemotherapy by injection," he commented.

Beyond the care and personal attention provided by the hospital, NEDH patients and their families seem to be learning their lessons well, since there hasn't been one case of blood infection among the 50 ambulatory patients who have received continuous ambulatory infusion over the past year. "Some patients and family members become so adept at handling the pump that they almost could work here," said Ms. Perri. "We learn new teaching approaches from their experiences. The patient/nurse relationship we have is a unique one because we get to watch their weekly progress. Many patients and their families are less frightened and mystified by chemotherapy," she added, "because they are encouraged to be – and are able to be – active participants in their own treatment plans."

A "thank you" from United Way

Suzanne Holloran, 1980 United Way campaign keyperson, and Tom Wright, keyperson elect for the 1981 campaign, wish to thank the many NEDH employees who contributed to make the 1980 campaign a success. Forty-five percent of all NEDH employees contributed approximately $30,000. This represents a 4% increase in employee participation over 1979. "The success of this campaign is directly related to the time and effort put forth by employees throughout the hospital to help many other Massachusetts citizens in the greater Boston area," said Ms. Holloran.

Mrs. Elsie Barker (l) retired from the Deaconess on February 27 after working for 15 years as a nurses aide on DTU East. Following a hospital party hosted by her co-workers, family members and friends, Mrs. Barker visited Los Angeles, California, to help celebrate her granddaughter Sumaria's first birthday.

Ambulatory infusion pump eases side-effects of chemotherapy for NEDH patients *(see page 1)*

Employees learn about cardiovascular fitness *(see page 1)*

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